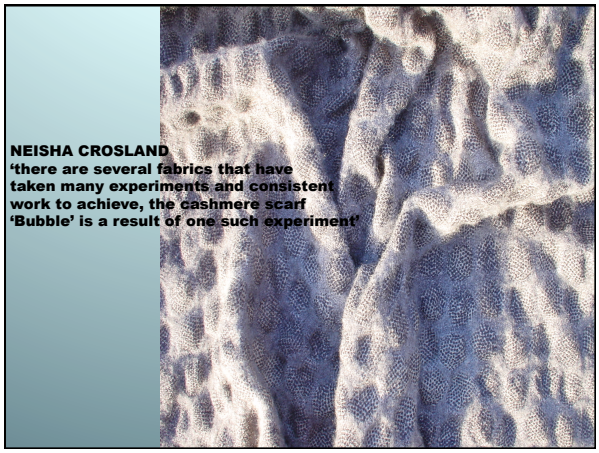
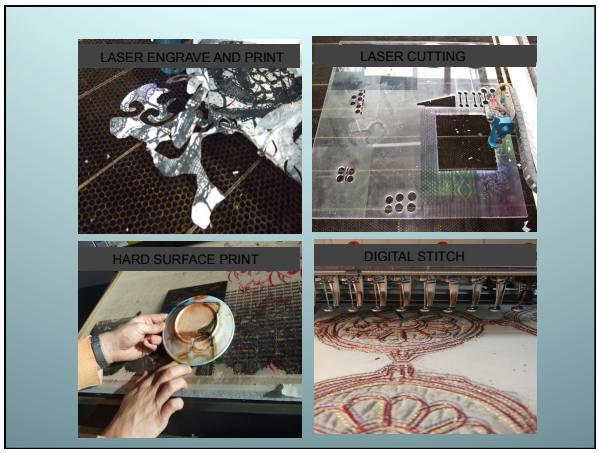
# Textile Applications: Digital and Traditional; Industry and Academia.

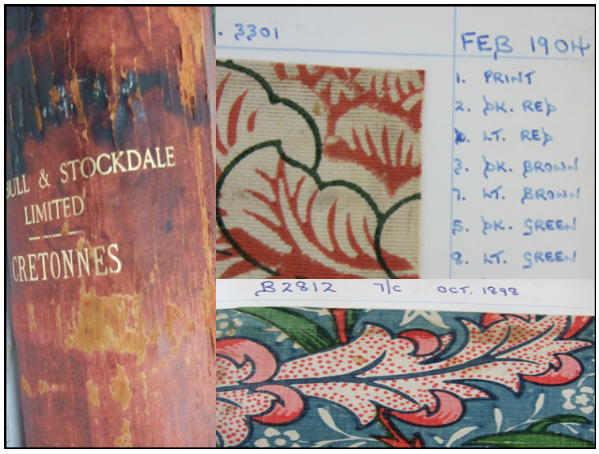

BELFORD PRINTS 1986 - 2004
"Neisha Crosland is always ten years ahead of everyone else, with consistently wonderful and original designs"
SUSANNA BARON OF BAER & INGRAM
FABRIC DESIGN: NEISHA CROSLAND
Britain's style-makers are taking us to the loo. By Charlo Carter


NEISHA CROSLAND
'there are several fabrics that have taken many experiments and consistent work to achieve, the cashmere scarf 'Bubble' is a result of one such experiment'

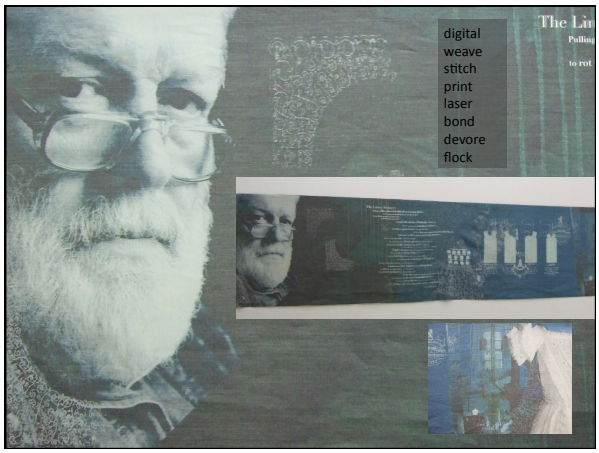

printed textures


LASER ENGRAVE AND PRINT
LASER CUTTING
HARD SURFACE PRINT
DIGITAL STITCH

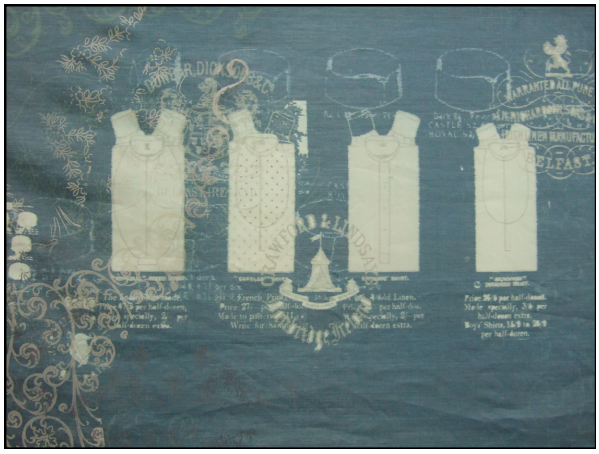
2006
TURNBULL Design Ltd


LL & STOCKDALE
LIMITED
RETONNES
3301
FEB 1904
1. PRINT
2. DK. RED
3. LT. RED
7. LT. BROWN
8. DK. GREEN
9. LT. GREEN
B2812 7/c OCT. 1898


THE LINEN INDUSTRY
By Michael Longley
University of Ulster
Smithsonian
Washington, USA
June 2007


digital
weave
stitch
print
laser
bond
devore
flock

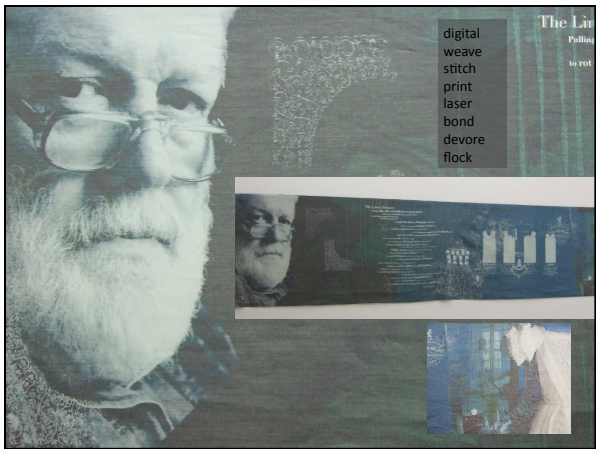

The Linen Industry
Pulling up flax after the blue flowers have fallen
And laying our handfuls in the peaty water
to rot those grasses to the bone,
or building stooks that
recall the skirts of invisible dancer,
We become a part of the linen industry
And follow it's processes to the grubby town
Where fields are conjected into window-boxes
And there is little room among the big machines,
But even in our attic under the skylight
We make love on a bleach-green, the whole meadow
Draped with material burning white in the sun
As though more reluctant to melt were our attire.
What's passion but a furrowing of stubborn stalks,
Then a gentle combing of fibres silk-fine
And a weaving of these into christening robes,
Into garments for a marriage or a funeral?
Since it's like a bereavement once the labour's done
To find ourselves last workers in a dying trade,
Let flax be our maidmaker, our undertaker,
The provider of sheets for whatever the bed -
And be shy of your breasts in the presence of death -
Say that you look more beautiful in linen
Wearing white petticoats, the bow on your bodice
A fluttering attending the unbridled child in us
©Michael Longley




Experiment with varying warp yarn formations
CUSTOMISE


Digitally printing the first image of Michael Longley


Selecting the weft


digital
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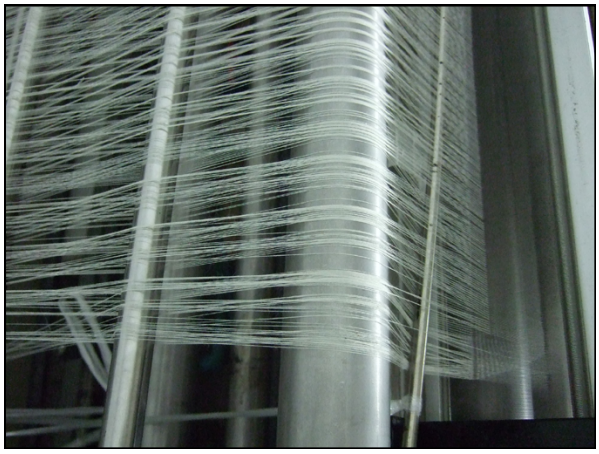
BETTY JACKSON AUTUMN WINTER 2008


DIGITAL PROCESSES are facilitating the revival rather than the survival of the 'HANDMADE' process.
TURNBULLTHOMPSON go further than using digital Technology to mimic the traditional, but look at the soul of the HANDCRAFT to create new and exciting hybrid textiles
www.turnbull-thompson.com


Mimaki 6




Digitally printing the first image of Michael Longley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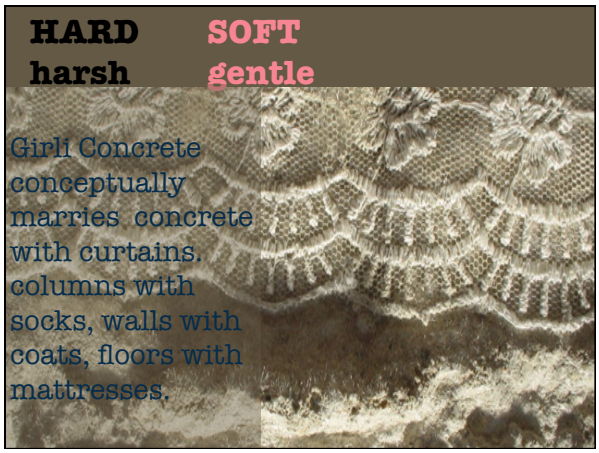
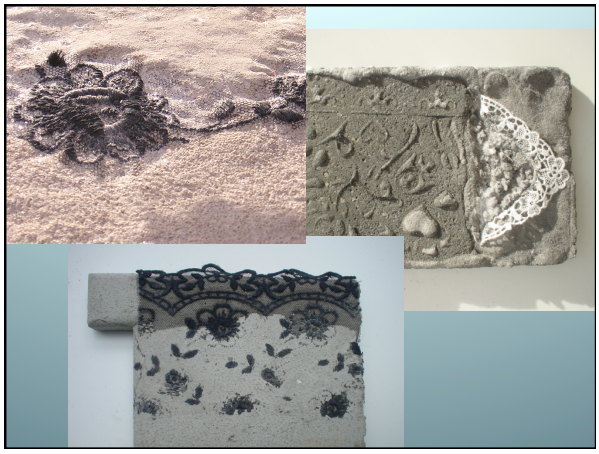
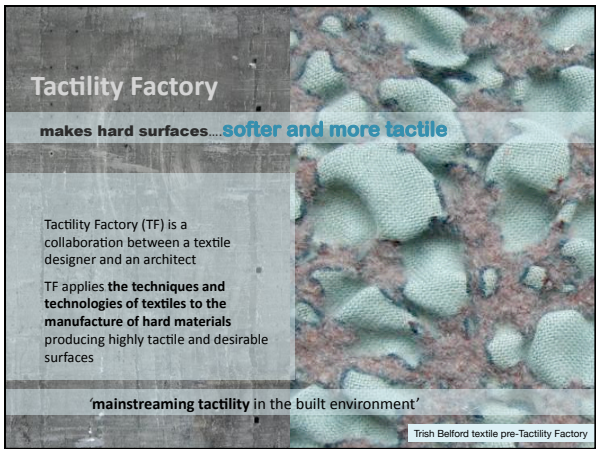
www.turnbull-thompson.com


Soft Garniture: Developing hybrid materials between academia and industry.
Girli
CONCRETE
Patricia Belford
Senior Research Fellow
Textiles
Ruth Morrow
Professor of Architecture
University of Ulster, Belfast, Northern Ireland


HARD
harsh
SOFT
gentle
Girli Concrete conceptually marries concrete with curtains, columns with socks, walls with coats, floors with mattresses.




printed textures


Tactility Factory
makes hard surfaces....softer and more tactile
Tactility Factory (TF) is a collaboration between a textile designer and an architect
TF applies the techniques and technologies of textiles to the manufacture of hard materials producing highly tactile and desirable surfaces
'mainstreaming tactility in the built environment'
Trish Belford textile pre-Tactility Factory

Over the last 3 years

## Tactility Factory

**has developed**

## Girli Concrete

**Girli Concrete** combines concrete and textile technologies

TF has resolved the technical challenges of placing delicate fabrics into the aggressive environment of Concrete

Textiles are specifically designed and manufactured to be placed in concrete

**'Breakthrough' Technologies** ensure that the textiles remain on the 'face' surface - the textiles are neither swamped by concrete nor do they peel off

**The result is a fully integrated, highly tactile surface of concrete and textile**

embroidered concrete detail

## Tactility Factory

currently moves forward through

**commissions** (currently)

Girli Concrete is currently commission driven, resulting in site-specific high-end products

**Derry Playhouse**

prestigious NI cultural venue: 7.5m long folded frieze (£10,000)

**Zumtobel**

Swiss lighting firm, panels for London HQ (invaluable product placement)

**others**

Private Clients, Commission for HRH Princess Anne on behalf of Women In Science, Engineering and Construction

**exhibitions** (currently)

**IFAI Design Exhibition 2008**

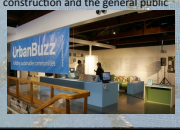
21st - 23rd October | Charlotte, N.C USA

*"featuring far out innovations with advanced textiles for health & safety"*

(8000 registered visitors for 3 day event)

**Urban Buzz Exhibition**

7th Oct - 15th November | Building Centre, London (2000 weekly visitors) the building centre is widely recognised as **the** cross-over venue for architecture, construction and the general public




Having resolved the technological challenges of girli concrete

## Tactility Factory

wishes **now** to:

1. Maintain an R&D Unit

(in the university)

TF has attracted approx £40K during the development of Girli Concrete. We wish to continue designing, testing and exploiting other hard/soft processes and building products and have submitted recent research council application for £750K to develop the Tactility Laboratory

2. Develop a Bespoke Workshop

(external to university)

To carry on one-off, bespoke commissions allowing TF to carry out live R&D testing and use such commissions to attract publicity acting as the 'Haute Couture' to off-the-shelf range (see below)

3. **License existing technologies / product packages to global Partner Companies** to manufacture off-the-shelf ranges

Linen Concrete Petal Detail

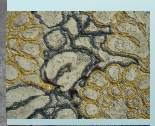
Hand & Lock

## Tactility Factory

**will license 3 technologies**

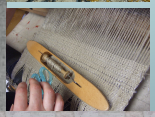
1. **embroidered concrete:**

the outcome looks as if the concrete has been stitched into. The surface is robust and possibly suited to external environments. Currently developing collaboration with Hand & Lock, London- bespoke global embroidery company (they have offered £30,000 product for G-Concrete use)



2. **puckered concrete:**

linen and stainless steel woven fabric results in a unique 3 dimensional surface (acoustic properties)



3. **linen concrete:**

The properties of linen mean it's a natural choice for use in concrete - we use multi layered fabrics to control the integration of concrete and linen

[Note: IPR on these technologies is currently being pursued by UUTech]

TF's Linen Concrete sample

So what is the size of the market for

## Tactility Factory ?

At this stage it's hard to say…

We believe that TF has created **'disruptive' technology** that will create new markets.

People don't know they 'need' our products until they see them. Once they experience the samples they can't resist- it's one of the reasons Girli Concrete attracts exhibition invites and press attention without seeking it. We believe it is a unique and strong brand.

As Alvaro **De Feranti,** the CEO of firm that specializes in luxurious wall surfaces for Middle east and Russia says:

***'I have never seen anything like this'***

[Incidentally he would like to commission 6 designs to be included in his range]

TF's main challenge therefore is:
**ensuring the girli concrete products and their potential application is fully recognised and understood**- through active publicity

**DE FERRANTI** specializes in luxurious surfaces for wall surfaces, sourcing rare and unusual products for architects and interior designers.

Projected turnover figures for TF Workshop

TF Workshop will produce Bespoke Projects and small, high-end product ranges (see current commissions)

Three Year Summary Profit / Loss

| | Year 1 | Year 2 | Year 3 |
|---|---|---|---|
| Sales Revenues | 72200 | 346800 | 535200 |
| Production Salaries | 29070 | 49950 | 72028 |
| Direct Cost of Sales | 18750 | 90300 | 142800 |
| Gross Profit | 23480 | 206550 | 320372 |
| Salaries & Wages | 67605 | 73260 | 111472 |
| General Overheads | 32199 | 41554 | 47533 |
| Sales & Marketing Costs | 29870 | 52340 | 79260 |
| Profit / Loss | -100134 | 38396 | 82108 |
| Initial Grant Support | 39000 | 0 | 0 |
| Net Profit/Loss | -65134 | 38396 | 82108 |

Royalties for licensing

We are currently seeking advice on how best to manage licensing and determine percentage royalties. At this stage TF can not sufficiently predict figures to include in turnover figures

Action Plan

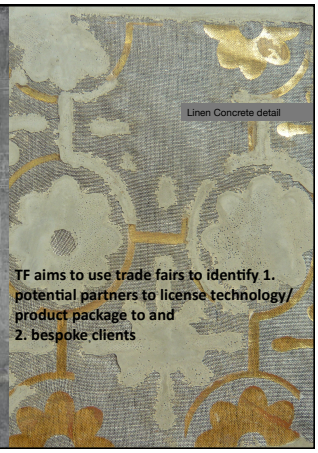
**Phase 1:** (without additional investment)
Complete Current Commissions - use to generate images insitu, press attention, etc

Actively pursue interest already shown from potential clients

follow-up potential in non-uk markets (Emirates, Russia, Switzerland)

**Phase 2**: (requires additional investment)
UUtech has offered TF £30,000 on condition that a further £30,000 is found from an external source. TF has had initial conversations with Invest NI on support to start the TF Workshop. We aim to bring this funding 'package' together in the months ahead allowing TF to:

**Find Permanent Space**
**Appoint Team**
**Generate product samples**
to promote through tradeshows and high profile interior/ architecture magazines.


Linen Concrete detail

**TF aims to use trade fairs to identify 1. potential partners to license technology/ product package to and 2. bespoke clients**

'from Islamic through European to Eastern patterns….'

## Tactility Factory

A range of product forms is possible:

Friezes, wall panels, tiles, folded elements, screens, exterior seating etc…

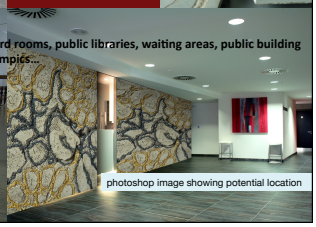
To date the motifs and graphics used within the products make reference to historical architectural symbols and imagery- such imagery can be designed to suit any culture


girli concrete samples and wall panels

**Girli concrete in**

**hotel lobbies, transport interchanges, board rooms, public libraries, waiting areas, public building foyers, temporary public events, 2012 Olympics…**


folded embroidered concrete element


photoshop image showing potential location

**FUTURE Potentials and Benefits:**

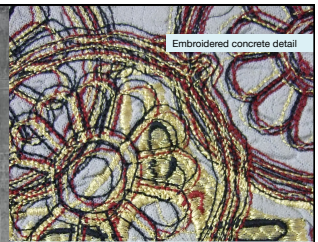
## Tactility Factory

During R&D, TF developed a lot of techniques/ technologies combining concrete and textiles - which have been set aside in order to focus on refining 3 technologies. There remains much more to exploit within the girli concrete range.

Not least- its **acoustic properties**.

Concrete surfaces are hard and acoustically, highly reflective. Their mass makes them ideal sound barriers. A soft surface concrete allows TF to exploit the acoustic strengths of concrete and resolve its acoustic weakness.

TF is currently working with the University of Sheffield to test and design fabrics which once embedded in concrete create a unique acoustic profile.


Embroidered concrete detail

**Benefits for industry and university**:
Unique distinctive project, interesting local story, strong profile.
Cross-disciplinary practice-based research that links high levels of creativity (blue sky thinking) with academic and practical outputs offering a range of potentials to exploit on a global market

## Tactility Factory is

**Belford** originated Belford Prints in London (1986) a unique textile company supplying to high end fashion market. (eg Vivienne Westwood, Jasper Conran) this aspect of commercial innovation and managing a small company (30 employees) is invaluable in the development of the TF.

**Morrow**'s family background is concrete production. She has worked both as an academic and practitioner and was appointed Professor of Architecture in 2003. Her work is framed by an entrepreneurial and collaborative approach. She is professionally well networked across Europe and is currently Chair of Northern Ireland's Architecture Centre.

Both partners are driven by the desire to innovate beyond their territories. They are keen users of IT to support the exchange of ideas, images, docs and maintain an active blog for the girli concrete project.
TF recently commissioned **a small animation** (final slide) to explain the TF concept and express our ambition ***to cover the world in Girli Concrete…***

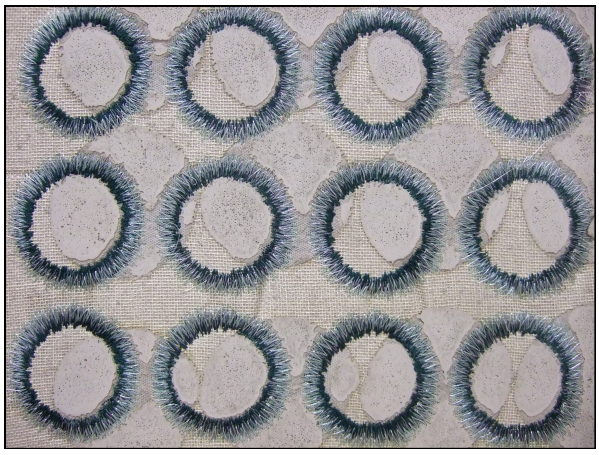
**Trish Belford, textile designer**
**Ruth Morrow, architect**

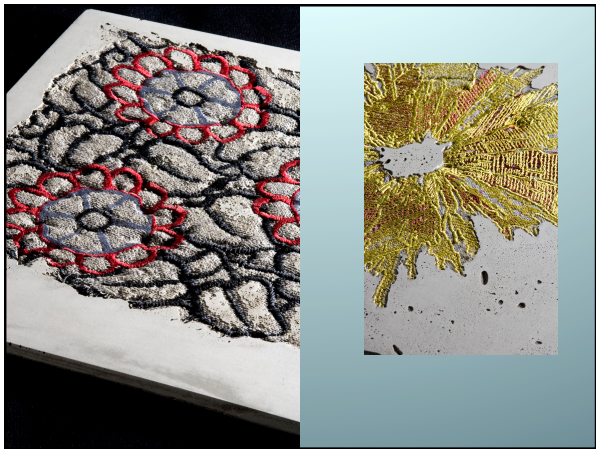
**girliconcrete.blogspot.com**

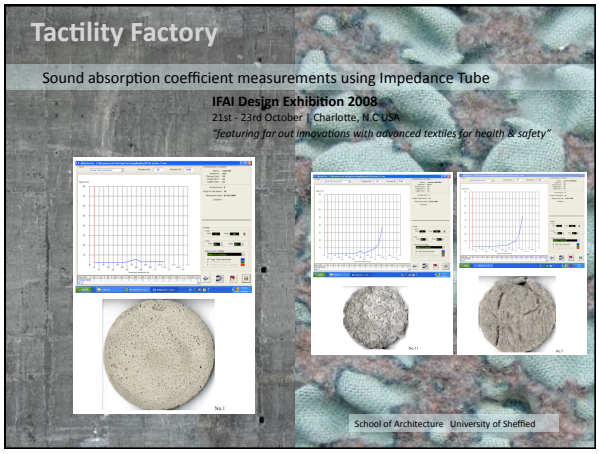


## Fabrication and Misconduct
motivations, lessons, outcomes of a girli concrete project

## Fabrication and Misconduct: outcomes






Tactility Factory
Sound absorption coefficient measurements using Impedance Tube
IFAI Design Exhibition 2008
21st - 23rd October | Charlotte, N.C USA
"featuring far out innovations with advanced textiles for health & safety"
School of Architecture University of Sheffied


WOVEN CONCRETE
Patricia Belford
Senior Research Fellow
University of Ulster
Ruth Morrow
Professor of Architecture
QUB
a Tactility Factory Project
An AHRC funded project
assisted by
Dr Andy Crangle
Research Associate
Textile Materials
Donna Campbell
Research Assistant
Weave


Linen bonded to a mesh before embedding,the concept of
Woven Concrete
was to remove this process

**INITIAL AIMS……**

**Apart from creating beautiful surfaces……**

**Prior to this investigation, fabric had been bonded to net to secure the fabric to the concrete (hidden beneath the skin)**

**This inspired the development of a weave structure to simulate the same effective application.**

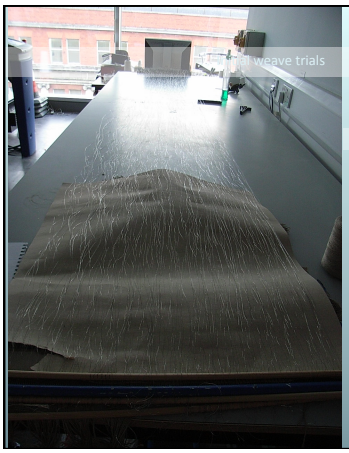
**The final fabric had to:**

**- withstand alkaline conditions**

**- be able to be devored revealing a pattern with the stainless steel yarn revealed to act as the replacement for the net.**

**CONCLUSION FROM YARN TRIALS**

- Protein fibres (wool & silk) do not like the alkaline environment presented in concrete.
- Flax / Linen which is cellulose based and commonly undergoes short term textile wet treatments in an alkaline environment will be selected for the purposes of this research.
- A stainless steel yarn to be incorporated in the weave structure,this weave construction will act as the unseen gripper beneath the skin of the concrete.

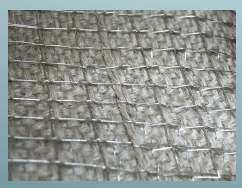


weave trials

Stainless steel warp and weft

True Leno

- Investigated as a potential means to secure the structure of the mesh, working on the principle of 2 warp ends working together to bind and lock the weft insertion.
- Small samples worked well but production not possible due to time restraints and twisting of the 0.22mm diameter stainless steel

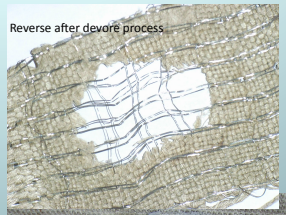


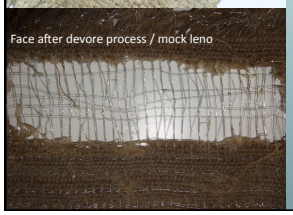
Mock Leno

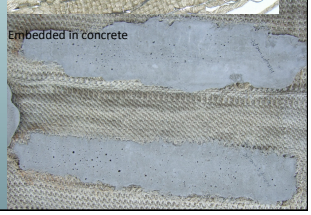
- Leno shafts replaced with standard shafts to create a mock effect.
- Although solving some of the time issue problems to configuration of a stainless steel warp and weft needs consideration from a practical point of view.

DEVORE TRIALS and concrete


Face after devore process / leno weave


Reverse after devore process


Face after devore process / mock leno


Embedded in concrete

The Derry Playhouse